NEW DIAMOND FIND IN THE TRANSVAAL.

THE latest Johannesburg papers (*Standard and Diggers' News, Financial Record*) bring news of a very interesting and probably economically important discovery of diamonds in place, at a distance of no less than 300 miles from the mines of Kimberley and Jagersfontein. The locality is 20 miles east of Pretoria, the capital of the South African Republic, and one mile east of Merwe, a station on the railway leading to Delagoa Bay. The outcrop forms a knoll, or 'kopje,' in the Magaliesburg range. It is on the farm Rietfontein, No. 501. The first announcement of the discovery was made to the Johannesburg Geological Society by Dr. David Draper, on September 12th.

The diamonds are found in a matrix, called by Mr. G. A. F. Molengraaff, State Geologist of the Transvaal, serpentine breccia, similar in nature to kimberlite. This rock extends over a small area not yet fully explored, but known to be at least 160 feet by 250 feet, and believed to be a volcanic neck. The kimberlite is much less decomposed than at Kimberley, the yellow ground being only 5 feet in depth, and the blue ground projecting above the general level, while at Kimberley the yellow or oxidized zone extended to more than 100 feet below the surface.

Only ten 'loads' (of 16 cubic feet) of rock had been washed up to September 20th. These, however, had yielded 23 stones. Dr. Draper reports one stone of 16 carats, another of 23, and the rest smaller. The 16-carat stone is said in the *News*, of September 25th, to be a fragment broken from a larger stone, the remainder of which has not been found. The yield per load would seem to be very high, but the amount washed is too small to justify predictions, while it certainly indicates a good 'prospect.' Dr. Draper reports garnet, carbonado, olivine and 'other minerals associated with the diamond' as present in abundance. He very properly points out the likelihood that there are other diamond deposits in the neighborhood, and suggests the expediency of a search for them.

The new diamond deposit occurs in the quartzites of the Magaliesburg range, about 35 miles due north of the Main Reef Series of the Witwatersrand, at its farthest known eastern extension. The correlation of these quartzites and those along the Witwatersrand is not altogether certain. Some authorities have maintained that the Magaliesburg rocks are equivalent to the series underlying the Main Reef. Others, with better reason, as it seems to me, consider them equivalent to the Gatsrand Series which overlies the Black Reef, to the southward of the Witwatersrand. In either case they are Paleozoic, and much earlier than the coal measures of the Karoo, which are supposed to be Triassic, and which rest unconformably on the Black Reef Series. The rocks of these earlier formations contain no coal and no bituminous shales so far as is known. In this new diamond occurrence there is no apparent reason to attribute the formation of the crystals to the local effect of lava on superficial deposits of amorphous carbon. It will be interesting to ascertain whether the lava of the new locality contains a soluble hydrocarbon like that which Sir Henry Roscoe found in kimberlite.

Diamonds have not been found in the Transvaal in the original matrix until the discovery here reported. In 1893, however, diamonds are said to have been found in auriferous ore close to Klerksdorp, in the southern part of the Transvaal. The gold-bearing ore at this point is reputed to be pudding stone of the Cape formation. The diamonds, of which somewhere about a score were found, were small and of a greenish tint.* I am not aware that any

*C. S. Goldmann, South African Mining and Finance, Vol. 2, 1895–6, page 29.

further finds were made at this point. If there is no mistake about this occurrence, there must have been diamonds in this region long before the intrusion of any known mass of kimberlite.

In the Orange Free State there are a number of localities at which the diamond has been found, although Jagersfontein is the only one which has yielded this gem in important quantities. The most northerly locality in the Free State of which I have heard is at Driekopjes, in the Kroonstad district. This district is bounded on the north by the Vaal River and it lies just south of Potchefstroom district, in the Transvaal. It is to be hoped that some geologist may eventually visit all the known diamond-bearing localities in South Africa and give the world the benefit of a comparative study.

GEORGE F. BECKER.

WASHINGTON, October 31, 1897.

CURRENT NOTES ON PHYSIOGRAPHY.

THE GREAT LAKES.

GILBERT'S discussion of 'Modification of the Great Lakes by Earth Movement,' presented to the Detroit meeting of the American Association, is published in the September number of the *National Geographic Magazine* (VIII., 1897, 233–247). It is truly astonishing that in the dozen years since the tilting of the ancient lake shore lines was recognized, and in our brief half century of accurate lake levellings, quantitative results as definite as those here announced should have been reached. A change of level of 0.42 foot per 100 miles per century in a direction about S. 27° W. seems to be assured. A line at right angles to this direction, drawn through the outlet of a lake, would have no change of level. All places on the lake shore northeast of such a line, or isobase, would emerge from the lake waters; all places to the southwest would be slowly submerged. Ontario lies altogether southwest of the isobase of its outlet; and, hence, the water must be encroaching on all its shores; the estimated rise at Hamilton being six inches a century. Erie is similarly situated, and the rise at Toledo is placed at eight or nine inches per century. The outlet isobase of Huron-Michigan leaves Huron altogether on the northeast, and crosses Michigan near its middle; the water surface must, therefore, be lowered ten inches a century on the northeast side of Georgian Bay, and six inches at Mackinac; while it must rise five or six inches at Milwaukee, and nine or ten at Chicago. "Chicago has already lifted itself several feet to secure better drainage, and the time will surely come when other measures of protection are imperatively demanded." In 500 or 600 years, high stages of the lake will discharge at Chicago by the ancient outlet of glacial Lake Michigan. In 1,000 years the discharge will occur at ordinary lake stages, and after 1,500 years it will be continuous. In about 2,000 years the discharge from Lake Michigan-Huron-Erie * * * will be equally divided between the western outlet at Chicago and the eastern at Buffalo. In 2,500 years the Niagara River will have become an intermittent stream, and in 3,000 years all its water will have been diverted to the Chicago outlet, the Illinois River, the Mississippi River and the Gulf of Mexico."

THE LAVA PLATEAU OF SOUTHEASTERN WASHINGTON.

THE lava plateau of the Columbia River basin, already described by Russell (Bull. 108, U. S. G. S.) a few years ago, now receives further attention from the same author (Irrigation Papers, No. 4, U. S. G. S.). A broad flat dome, uplifted 2,000 feet over the surrounding country and well dissected, forms the Blue Mountains; so well clothed with rock waste that one is astonished to learn that they are composed of